



Bloomenergy®

ELECTROLYZER TECHNOLOGY

December 2021

BLOOM ENERGY AT A GLANCE

BE
LISTED
NYSE

Headquarters  Office Locations  Manufacturing and R&D Locations 



MISSION
To make clean, reliable energy affordable for everyone in the world.

Power Electronic Design Centers
-- Bangalore, India
-- San Jose, Calif.

Power Electronic Manufacturing
-- Bangalore, India
-- Taiwan

\$794m
2020 Revenue

30% CAGR
Over last decade

~\$4bn
Product + Service Backlog

~500MW
Installed Base

364
Issued Patents

>\$650mm
Cumulative R&D

SCALE AND EXPERIENCE

Bloom's unmatched scale in Solid Oxide Fuel Cell (SOFC) translates directly to Solid Oxide Electrolyzer Cell (SOEC)

Bloom is the leader in SOFC technology

700+
Sites deployed

500MW+
Installed Base



Powering Fortune 100 Brands



Building scale and experience in the process

30% + annual growth
Over the last decade

800 billion+
cell hours

~\$1 billion
Cumulative RD&D



Which is directly translatable to hydrogen generation

Same core platform



Same supply chain

Same manufacturing process

Same partners

Same monitoring infrastructure

BLOOM'S HYDROGEN ADVANTAGES

Bloom Energy's solid oxide platform provides customers with **four key advantages**:



- 1 Scale and experience**, since our industry-leading fuel cell platform is the same core technology we use in hydrogen electrolysis
- 2 Higher efficiency**, requiring less electricity to produce hydrogen
- 3 Faster-declining costs** which, together with the efficiency benefit, makes Bloom the lowest-cost solution at scale, depending on the application, region and means of production
- 4 Unique flexibility**, allowing Bloom to serve more applications to serve customer needs

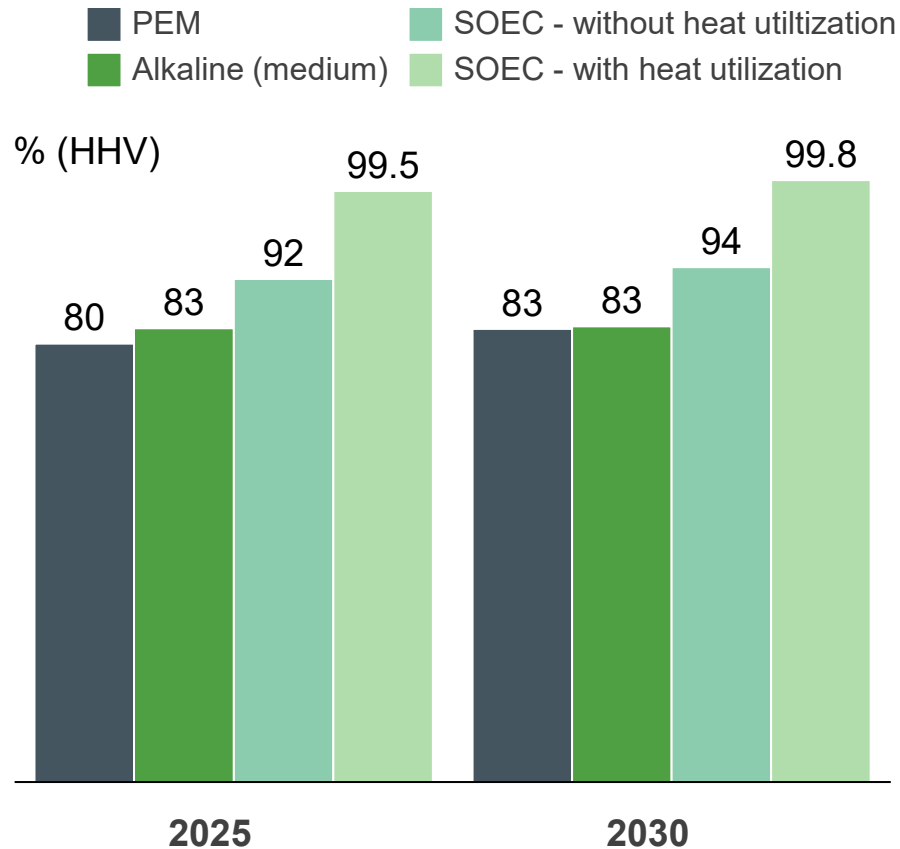
This combination positions Bloom to deliver better value and superior economics versus legacy technology

ELECTROLYZER TECHNOLOGIES

	PEM Electrolysis	Alkaline Electrolysis	Solid Oxide Electrolysis
Description	Based on polymer membrane on a plate under high voltage and high current	Production reaction occurring in liquid alkaline solution	Solid ceramic material as electrolyte operating at high heat to reduce electrical needs
Operating Temperature	70° – 90° C	50° – 90° C	700° – 800° C
Efficiency (kWh/kg) [lower values are more efficient]	52	54	37 / 42 (with/without heat integration)

Higher operating temperature of SOEC provides a greater overall efficiency

SOEC IS THE MOST EFFICIENT ELECTROLYSIS TECHNOLOGY



SOEC efficiency advantage is grounded in the fundamental physics of the cell which translates to lower electricity usage and lower costs

SOECs are more efficient at baseline than others, providing an **11% advantage by 2025**

When paired with waste heat in industrial and nuclear applications, **SOEC advantage grows to 30%+ by 2025**

1.Note: 100% HHV = 39 kWh/kg

Source: IEA, Bloomberg New Energy Finance, Bloom energy, O. Schmidt et. al. Future cost and performance of water electrolysis: An expert elicitation study (2017)

HYDROGEN PARTNERSHIP ANNOUNCEMENTS

Bloomenergy | Baker Hughes 

ANNOUNCEMENT

**BAKER HUGHES AND BLOOM ENERGY
TO COLLABORATE ON EFFICIENT POWER
AND HYDROGEN SOLUTIONS TO
ACCELERATE ENERGY TRANSITION**

Bloomenergy

ANNOUNCEMENT

**BLOOM ENERGY AND IDAHO NATIONAL
LABORATORY TO GENERATE HYDROGEN
POWERED BY NUCLEAR ENERGY**

Bloomenergy |  Heliogen

ANNOUNCEMENT

**BLOOM ENERGY AND HELIOGEN
JOIN FORCES TO HARNESS THE
POWER OF THE SUN TO PRODUCE
LOW-COST GREEN HYDROGEN**

Bloomenergy

ANNOUNCEMENT

**BLOOM ENERGY AND SK E&C WIN
COMPETITIVE BID FOR KOREA'S
CHANGWON RE100 PROJECT**

The expanded partnership will supply **100% hydrogen-powered
solid-oxide fuel cells and electrolyzers**



Bloomenergy[®]